

Affected Environment

for

Project 1440-13/15-00
WIS 23 (Fond du Lac - Plymouth)
Fond du Lac and Sheboygan Counties

AFFECTED ENVIRONMENT

Section III provides background information on regional and local planning, the human environment and the natural environment in the WIS 23 study area. Information is also shown for cultural resources, agricultural resources, and the public use of lands. This review of the affected environment establishes the background for which the improvement on WIS 23 and their impacts are evaluated.

GEOGRAPHICAL SETTING

The WIS 23 corridor is located in Fond du Lac and Sheboygan Counties in east-central Wisconsin. The west end of the corridor begins in the City of Fond du Lac and follows through the Towns of Empire, Forest, Greenbush, and Plymouth. The east terminus of the corridor is just west of the City of Plymouth. The topography along this section of WIS 23 runs through rolling glacial moraines and drumlins. WIS 23 also crosses two unique glacial features, the Niagara Escarpment on the far west section of WIS 23, rising 300 feet above the lowlands adjacent to Lake Winnebago, and the uplands of the Kettle Moraine State Forest in the Town of Greenbush, which is a recessional moraine. Elevations range from 800 feet (USGS Datum) near County K in the City of Fond du Lac to 1170 feet in the Kettle Moraine State Forest.

SOCIOECONOMIC CHARACTERISTICS

Population Levels and Trends

Table III-1 lists the population levels and trends for municipalities in the study area. Town of Empire and the City of Fond du Lac will experience the largest population increase from the period between 2000 and 2020. Town of Empire is expected to grow 11.46% while the City of Fond du Lac is expected to grow 14.73%.

Table III-1

Name of Municipality	Census 1980	Census 1990	Census 2000	Projection 2005	Projection 2010	Projection 2015	Projection 2020	Population Change 2000-2020	Percent Change 2000-2020
T. Greenbush	1,665	1,849	2,619	2,633	2,645	2,661	2,680	61	3.65%
T. Empire	2,359	2,485	2,620	2,687	2,757	2,824	2,890	270	11.46%
T. Forest	1,098	1,094	1,108	1,128	1,147	1,166	1,184	76	6.92%
C. Fond du Lac	35,863	37,755	42,203	43,573	44,918	46,209	47,486	5,283	14.73%

Source: Preliminary Population Projections for Wisconsin Municipalities: 2000-2020, Wisconsin Department of Administration

Housing

Table III-2 lists the number of specified owner-occupied housing units for municipalities in the study area. The Town of Forest has the highest median home value at \$157,900 while the City of Fond du Lac has the lowest median home value at \$91,200.

Table III-2

Number of Specified Owner-Occupied Housing Units										
Municipality Name and Type	Total Specified Owner-Occupied Housing Units	Less Than \$50,000	\$50,000 To \$99,999	\$100,000 To \$149,999	\$150,000 To \$199,999	\$200,000 To \$299,999	\$300,000 To \$499,999	\$500,000 To \$999,999	\$1,000,000 Or More	Median Value
T. Greenbush	294	0	89	103	65	31	6	0	0	\$133,500
T. Empire	671	3	66	241	151	120	82	8	0	\$157,900
T. Forest	217	7	62	95	39	10	2	0	2	\$120,600
C. Fond du Lac	9,471	458	5,338	2,424	790	358	78	20	5	\$91,200

Source: Tables H74 and H76, SF3 CD-ROM, U.S. Bureau of the Census.

Incomes

The Town of Forest has the lowest household income at \$49,583 while the Town of Empire has the highest household income at \$67,330. All municipalities in the study area have less than 5% of families below poverty. See Table III-3 below for Municipalities in the study area.

Table III-3

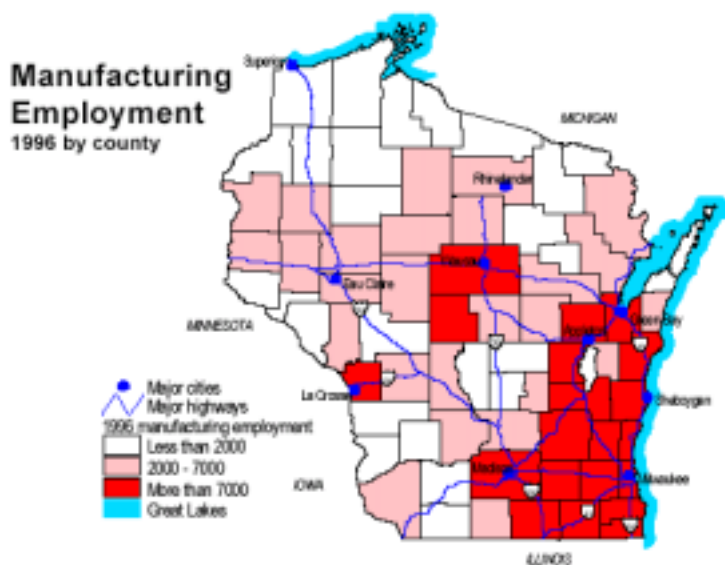
INCOME AND POVERTY STATUS FOR WISCONSIN COUNTIES AND MUNICIPALITIES APRIL 1, 2000							
Municipality	Per Capita Income In 1999 Dollars	Median Income In 1999 Dollars		Poverty Status *			
		Households	Families	Number of Persons Below Poverty	Percent of Persons Below Poverty	Number of Persons Below Poverty	Percent of Families Below Poverty
T. Greenbush	\$17,050	\$54,118	\$56,029	39	2.53	9	2.01
T. Empire	\$27,174	\$67,330	\$70,511	38	1.46	4	0.50
T. Forest	\$19,848	\$49,583	\$55,469	37	3.27	7	2.25
C. Fond du Lac	\$18,996	\$41,113	\$50,341	2,992	7.51	485	4.63

Source: 1990 Census Data from summary tape file 3A, 2000 Census Data From Summary 3, File 3, U.S. Bureau of the Census (Prepared by Demographic Services Center, Wisconsin Department of Administration)

Tax Base

The Sheboygan metropolitan area has the highest proportion of manufacturing jobs (39%) of any metropolitan area in Wisconsin. Sheboygan and Fond du Lac Counties each employ more than 7,000 workers in the manufacturing industry. The largest employers in each county are manufacturers. The two largest employers in Sheboygan County include Kohler Company and Bemis Manufacturing Company. The two largest employers in Fond du Lac County include Brunswick Corporation and International Paper Company. The manufacturing industry in both counties also produces the highest sales. The manufacturing industry in Fond du Lac County produces \$2.445 billion in sales, receipts or shipments while Sheboygan County produces \$4.252 billion in sales, receipts or shipments.

Figure III-1.



Source: Facts About Wisconsin's Manufacturing Base, Wisconsin Department of Commerce.

Table III-4 Wisconsin Labor Market Information

Sheboygan County - Employers with >1000 Employees			
Rank	Employer Legal Name	Product or Service	Employment Size Range
1	Kohler Co	Enameled iron and metal sanitary ware	1000+
2	Bemis Mfg. Co	Plastic products	1000+
3	Sheboygan Public School	Elementary and secondary schools	1000+
4	County of Sheboygan	Executive & legislative offices combined	1000+
5	J L French Corp	Aluminum die-castings	1000+
6	Aurora Health Care Central Inc.	General medical and surgical hospitals	1000+

Source: Wisconsin Labor Market Information, Wisconsin Department of Workforce Development.

Table III-5 Wisconsin Labor Market Information

Fond du Lac County - Employers with >1000 Employees			
Rank	Employer Legal Name	Product or Service	Employment Size Range
1	Brunswick Corp	Internal combustion engines	1000+
2	Intl Paper Co	Corrugated and solid fiber boxes	1000+
3	Agnesian Healthcare Inc.	Miscellaneous retail stores	1000+
4	Fond du Lac School District	Elementary and secondary schools	1000+
5	County of Fond du Lac	Executive & legislative offices combined	1000+

Source: Wisconsin Labor Market Information, Wisconsin Department of Workforce Development

**Table III-6 1997 Economic Census: Summary Statistics for Fond du Lac County, WI 1997
NAICS Basis (Taxable)**

Description	Establishments	Sales, Receipts or Shipments (\$1,000)	Annual Payroll (\$1,000)	Paid Employees
Mining (npfc)	N	N	N	N
Utilities (npfc)	N	N	N	N
Construction (npfc)	N	N	N	N
Manufacturing	158	2,445,694	393,225	11,150
Wholesale Trade	116	528,208	35,961	1,204
Retail Trade	413	891,209	86,612	5,744
Transportation and Warehousing (npfc)	N	N	N	N
Information (npfc)	N	N	N	N
Finance and Insurance (npfc)	N	N	N	N
Real Estate and Rental and Leasing	73	27,861	4,535	297
Professional, Scientific, and Technical Services	137	45,931	17,961	630
Management of Companies and Enterprises (npfc)	N	N	N	N
Administrative and Support and Waste Management and Remediation Services	66	69,769	24,061	1,403
Educational Services	9	971	257	29
Health Care and Social Assistance	157	181,223	54,193	1,748
Arts, Entertainment and Recreation	36	8,628	2,697	278
Accommodation and Foodservices	227	92,949	25,595	3,584
Other Services (except public admin.)	162	44,381	13,693	945

npfc = Not available for counties; N = Not available

Source: 1997 Economic Census, U.S. Census Bureau

Table III-7 1997 Economic Census: Summary Statistics for Sheboygan County, WI 1997
NAICS Basis (Taxable)

Description	Establishments	Sales, Receipts or Shipments (\$1,000)	Annual Payroll (\$1,000)	Paid Employees
Mining (npfc)	N	N	N	N
Utilities (npfc)	N	N	N	N
Construction (npfc)	N	N	N	N
Manufacturing	239	4,252,678	628,324	20,047
Wholesale Trade	119	1,185,023	65,379	2,041
Retail Trade	398	911,049	88,045	5,831
Transportation and Warehousing (npfc)	N	N	N	N
Information (npfc)	N	N	N	N
Finance and Insurance (npfc)	N	N	N	N
Real Estate and Rental and Leasing	85	38,168	6,236	400
Professional, Scientific, and Technical Services	150	92,214	40,473	1,235
Management of Companies and Enterprises (npfc)	N	N	N	N
Administrative and Support and Waste Management and Remediation Services	80	35,289	18,730	1,333
Educational Services	7	903	173	18
Health Care and Social Assistance	176	134,299	74,758	2,412
Arts, Entertainment and Recreation	29	26,254	6,306	698
Accommodation and Foodservices	237	105,915	29,104	3,714
Other Services (except public admin.)	172	56,547	14,596	967

npfc = Not available for counties; N = not available

Source: 1997 Economic Census, U.S. Census Bureau.

Workforces and Occupations

Appendix C shows detailed workforce and occupation for each municipality in the study area. The manufacturing industry and education, health and social services industry employ many of the residents in the study area. However 17% of Town of Forest residents are employed in the agriculture, forestry, fishing, hunting and mining industry.

Table III-8 Employment by Industry

Percent of Residents Employed by Industry		
	Manufacturing	Education, Health, Soc. Serv.
Town of Forest	27%	12%
Town of Empire	21%	24%
Town of Greenbush	34%	16%
City of Fond du Lac	26%	18%

Source: U.S. Census Bureau.

LAND USE AND RELATED CHARACTERISTICS

Residential

Residential development is sparsely scattered through out the study area. Most is concentrated along existing WIS 23. Concentrated residential development exists in the community of Greenbush and the western portion of the study area near the City of Fond du Lac. Individual residences are intermixed with farm residences throughout the project study area.

Commercial/Industrial

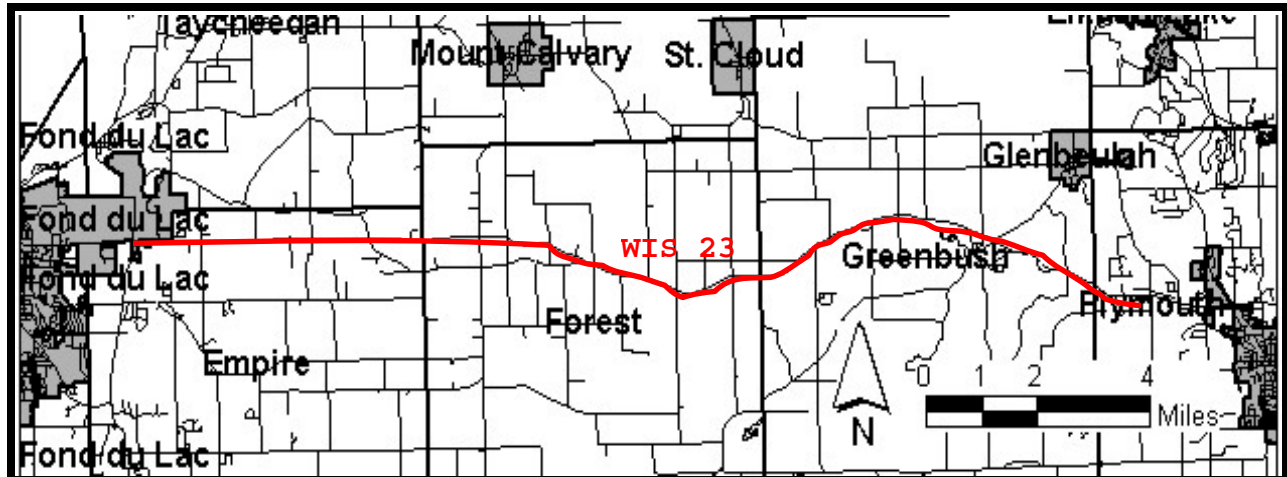
Minimal industrial development exists in the study area and is located near the City of Fond du Lac. Commercial development is very sparsely scattered along WIS 23.

Area Communities

The community of Greenbush and a portion of the City of Fond du Lac are located in the project study area. See Figure III-2 below for the location of these communities.

Figure III-2

AREA COMMUNITIES



Public Use Lands

Public lands occur throughout the project area. The Northern Unit of the Kettle Moraine State Forest lies at the east end of the project. Within the Forest, the Ice Age National Scenic Trail crosses existing WIS 23 near Ridge Road, as shown on the map. A State Equestrian Trail through the Forest coincides with the Ice Age Trail at the WIS 23 crossing. The Old Plank Road Trail lies along the south side of WIS 23 from the City of Plymouth to Greenbush and is within the WisDOT right-of-way. Local snowmobile trails are found on private and public lands throughout the study corridor. There are no public hunting and fishing lands in the study area.

Agricultural Land

Majority of land in the project study area is non-irrigated cropland. Farmsteads are scattered throughout the project study area. See Appendix D, Comments and Coordination, for a copy of the Agricultural Impact General Letter.

Institutions

The Fond du Lac School District, the Cambellsport School District, the Elkhart Lake-Glenbeulah School District and the Plymouth District serve the project study area. All school districts use school buses. St. Mary's Springs High School is located at the intersection of County K and WIS 23 and St. Paul's Church and School is located at County W and WIS 23.

The project area is served by the Moraine Park Technical College, the UW Extension – Fond du Lac County, and the UW FDL (700 students) campuses on the northeast side of the City of Fond du Lac, about one mile west of the project limits. Marian College (2600 students) is also located within two miles of the project limits in Fond du Lac.

St Agnes Hospital in Fond du Lac and the Valley View Medical Center in Plymouth serve the project study area.

Kettle Moraine Correctional Institution for adult males is located adjacent to Kettle Moraine State Forest in Sheboygan County approximately 10 miles west of the city of Plymouth, and 17 miles southeast of Fond du Lac.

Cemeteries

Forest Home Cemetery is nearby WIS 23, about 1000 feet north of the highway on Hillview Road. Forest Cemetery is just north of Poplar Road, west of County W.

Planning and Zoning

Municipalities in the project study area share a common goal – agricultural preservation. Both towns of Forest and Empire comprehensive plans list agricultural preservation as a goal. The Sheboygan County University of Wisconsin-Extension Office in cooperation with the Town of Greenbush long-range planning committee and the Greenbush town board prepared a document titled “Town of Greenbush, Long Range Planning Program Report of Trends, Survey Results and Recommendations.” The report indicated the Town of Greenbush residents (69.6% of 167 survey responses) agree that the town government should develop agricultural land preservation as a priority goal and implement policies to achieve it.

Farmland preservation is also a common goal for Sheboygan and Fond du Lac Counties as well. Each County has a farmland preservation plan as well as a recreation plan.

The Fond du Lac County recreation plan includes a recommendation for the provision of a trail facility along WIS 23.

The following municipalities have comprehensive plans:

- Town of Forest
- Town of Empire
- City of Fond du Lac
- City of Plymouth

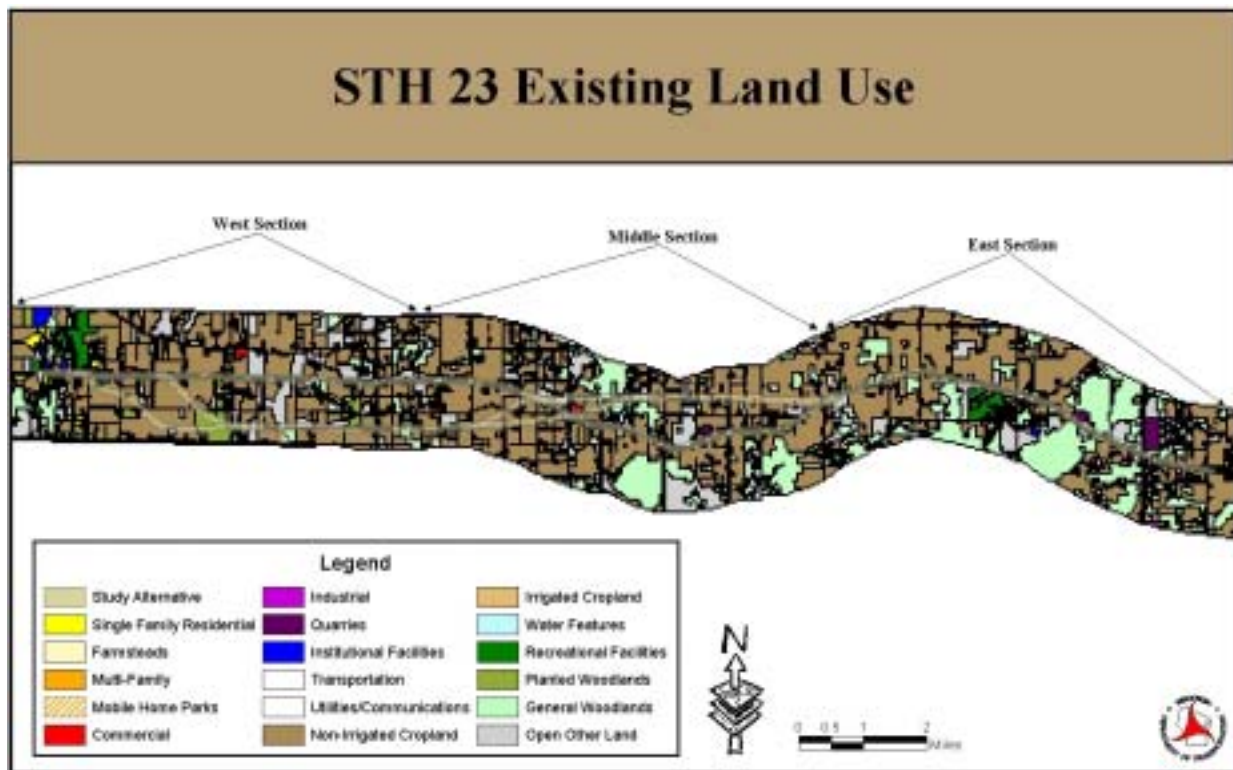
Due to its proximity to the the City of Fond du Lac urbanized area, the Town of Empire faces more development pressure than the other towns in the project study area. A cooperative boundary agreement exists between the Town of Empire and City of Fond du Lac. The city’s growth area boundary extends just east of County UU. Residential subdivisions will likely occur in the growth area north and south of WIS 23. The rolling terrain also makes this area attractive for residential development.

Below is a list of municipal and county ordinances within the project study area.

- Town of Forest – town zoning ordinance
- Town of Empire - town zoning ordinance
- City of Fond du Lac – subdivision ordinance, zoning ordinance, floodplain zoning ordinance
- Sheboygan County – subdivision (land division) ordinance, sanitary ordinance, shore land floodplain ordinance, non metallic mining ordinance

Land Use Patterns

Land use in the study area is shown on the map below and also on a larger version in Section IV page D-8. Most of the land in the study area is non-irrigated cropland.



Community Service

The County Sheriff in Fond du Lac and Sheboygan Counties provides police protection in the project area. Mt. Calvary provides fire protection from County UU to Hillview Road, and ambulance service from County UU to the county line with County W as a main route. St. Cloud provides fire service from Hillview Road to the county line with County G as a main route. The City of Fond du Lac ambulance services portions of WIS 23 between County K and County UU and fire department and some portions are covered by the Town of Eden fire department. The Sheboygan County portion is covered by the Greenbush fire department and Plymouth ambulance service.

Utilities

WE Energies and Verizon Communications serve the Sheboygan County portion of the WIS 23 project area. WE Energies has transmission lines on the south side of WIS 23 from the west county line to County U, where it switches to the north side of the highway until Sugarbush Drive in the Town of Greenbush. The lines are then on the south side of WIS 23 until the east termini of the project. Verizon's lines cross WIS 23 and run parallel to the highway in several different areas within the Sheboygan County portion of the project. Time Warner Cable has lines that cross WIS 23 in several places but do not run parallel with the highway.

The Fond du Lac portion of the WIS 23 project area is served by WE Energies. WE Energies has transmission lines on the south side of WIS 23 from the west project limits to approximately Hinn Road. At Hinn Road the lines switch to the north side of WIS 23 for ½ mile to Loehr Road and then continue on the south side until Hickory Road. There are no lines adjacent to the road from Hickory Road to County G. Transmission lines are found on the south side of WIS 23 from County G to the east Fond du Lac county line. Verizon's lines cross WIS 23 and run parallel to the highway in several different areas within the Sheboygan County portion of the project. Other utilities cross WIS 23 in several places but do not run parallel with the highway. The City of Fond du Lac has sewer lines parallel to WIS 23, eastward toward County UU.

The city has plans to provide sewer and water out to County UU on both sides of WIS 23.

Transportation

WIS 23 is the only major highway serving the corridor study area. Several US and state highways intersect WIS 23 within 5 miles of either end of the project area. These include US 41, US 45, US 151, and WIS 175 in Fond du Lac and WIS 57 and WIS 67 in Plymouth. In addition, access to I43 is about 10 east of Plymouth.

County Highways in the corridor is important to the local transportation network. County K, County UU, County W, County G, in Fond du Lac County and County T, County A, County S, and County P in Sheboygan County all intersect WIS 23 and service mostly north and south traffic and are classified as major collectors.

There is no rail service in the area of WIS 23. Fond du Lac County Airport is the only airport near the project area, approximately 5 miles west of the project. This airport is not serviced by commercial airlines for passenger service. There are no regularly scheduled bus routes on WIS 23 between the City of Fond du Lac and the City of Sheboygan.

NATURAL ENVIRONMENT AND RELATED RESOURCES

Natural and Conservancy Areas

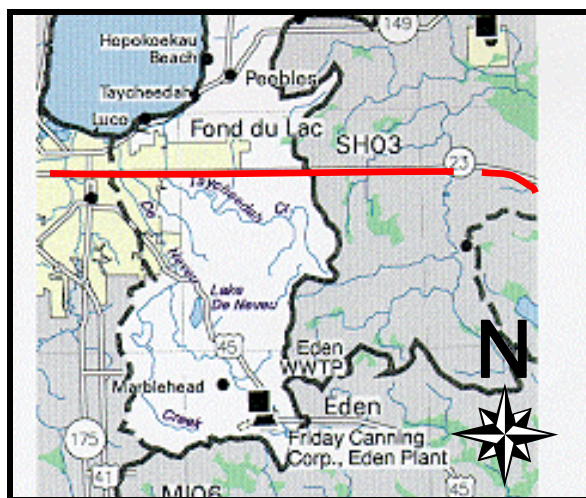
Designated Natural Areas, as defined by the Wisconsin Natural Areas Preservation Council, are tracts of land or water so little modified by man's activity or sufficiently recovered from the effects of such activity that they contain intact native plant and animal communities believed to be representative of the pre-settlement landscape. Designated natural areas are those officially listed by the DNR and the Preservation Council (<http://www.dnr.state.wi.us/org/land/er/sna/napc.htm>). There are no designated natural areas within the WIS 23 study area.

Surface Water and Fishery

There are four watershed areas that are found within the study area: the eastern Lake Winnebago Watershed, the Sheboygan River watershed, and the Mullet and Onion River watersheds, which flow into the Sheboygan River.

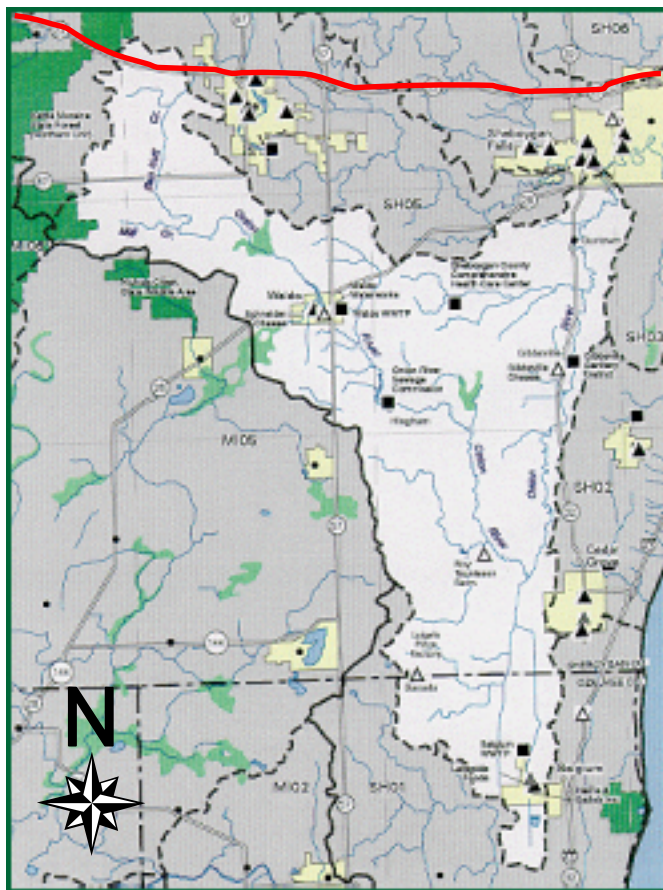
Taycheedah Creek

Taycheedah Creek drains a small area of the eastern Lake Winnebago Watershed, within the northwest quarter of the Town of Empire. There are no crossings of the corridor study area.



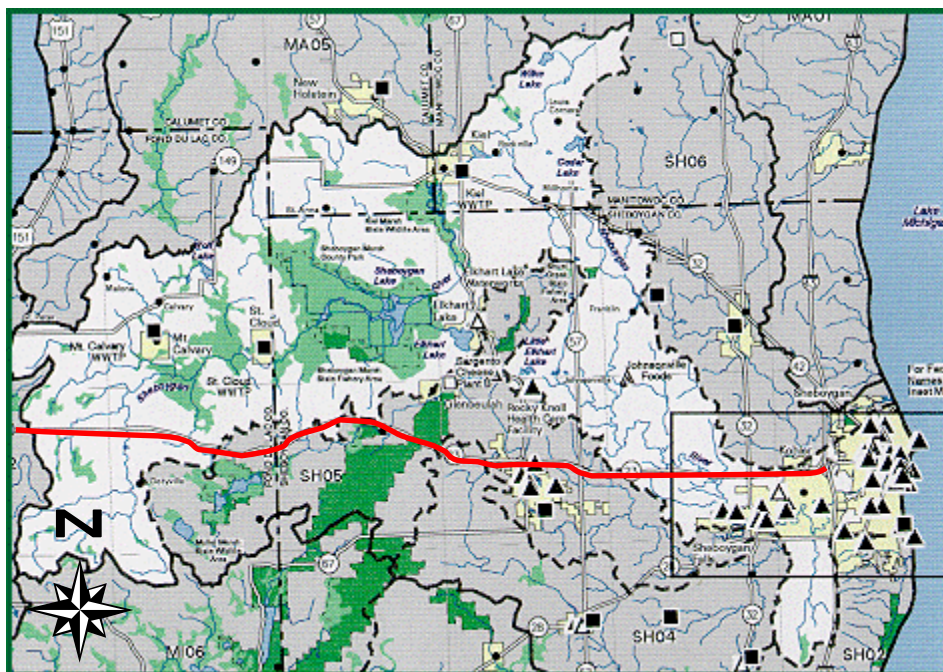
Onion River Watershed

The Onion River drains 99 square miles of the southernmost portion of the Sheboygan River Basin tributary to the Sheboygan River. The junction of Ben Nutt Creek and Mill Creek in the kettle moraine region, west and southwest of the City of Plymouth form the river. The Onion River flows southerly for more than half of its length then turns northward and flows into the Sheboygan River in the City of Sheboygan Falls.



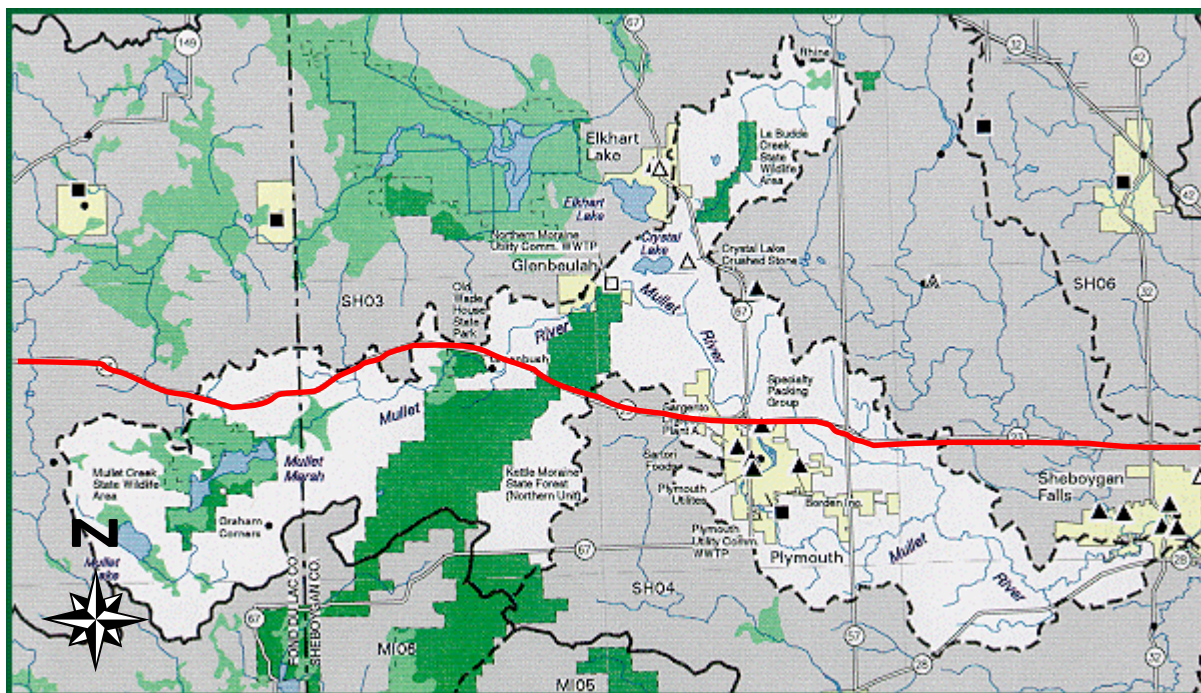
Sheboygan River Watershed

There is one major crossing of the corridor study area. This reach of the Sheboygan River Segment 5 (RM 68.3-81.0) originates at the headwaters and terminates 12.7 miles downstream at County W. The waterway supports warm water sport fish such as northern pike, sunfish, yellow perch and bullheads, and tolerant forage fish species such as shiners, white suckers and creek chubs. Water quality is somewhat degraded by sedimentation, excess nutrients and loss of habitat. The Dotyville Sportsman's Club operates a trap range immediately north of Walnut Road and west of the river, located such that lead shot has the potential to drop into the river and along the banks. A series of holding ponds occur near the river in NW ¼ NE ¼ Sec 18 T15N R19E. The ponds were used to dispose of brine process wastewater and abandoned in 1986. No surface water contamination is evident from these ponds but there is possible groundwater contamination. Sedimentation, nutrients, and loss of habitat degrade water quality in this segment. Responsible factors include cattle pasturing, cropland runoff, stream bank erosion, and channelization. This segment is classified as supporting a warm water sport fish community. Habitat and water quality currently support an assemblage of tolerant forage and warm water game fish. Representative sport fish consist primarily of northern pike, sunfish, yellow perch, and bullheads. Common forage species include shiners, white suckers, and creek chub. A tributary to the Sheboygan River, Feldner's Creek, begins about 0.7 mile north of Alternative B and flows north (T16N R19E Section 35 NENW). The creek is spring fed and a Class II trout stream. Water quality in the upper reach of Feldner's Creek is very good, with gravel spawning areas for brook trout, intolerant forage fish, and warm water sport fish.



Mullet River Watershed

The Mullet River originates from the outflow of Mullet Lake and the Mullet River State Wildlife Area in Fond du Lac County and flows in an easterly direction for approximately 40 miles to its confluence with the Sheboygan River in the Town of Sheboygan Falls, 17 miles upstream of Lake Michigan. The water quality of the Mullet River is considered good from its headwaters to the City of Plymouth. The middle of the river, from the City of Plymouth to the Village of Glenbeulah, has an increase in spring flow that lowers stream water temperatures and is classified as a Cold Water Community stream (trout). Upstream of Glenbeulah, and downstream of WIS 67 near the City of Plymouth, the Mullet River is classified as a Warm Water Sport Fish Community stream. Fish species include rock bass, largemouth and small mouth bass, sunfish and intolerant forage species such as Iowa Darter and Redbelly Dace. Downstream of the project area, between the Village of Glenbeulah and the City of Plymouth, spring inflows lower stream temperatures and the River supports cold-water sport fish. This classification difference is due primarily to the increase in spring flow between the Village of Glenbeulah and the City of Plymouth. The Mullet River is unique in that it flows from the warm water headwaters into a cold-water segment. All of the other major tributaries in the Sheboygan Basin, including the Sheboygan and Onion Rivers, originate as coldwater streams and change over to warm water further downstream. The existing chemical and biological water quality information support the Mullet River's current biological classification. The river segment that flows through the Kettle Moraine State Forest Northern Unit, the Mullet Creek State Wildlife Area, and the Old Wade House State Park are located within the warm water sport fish community segment. There is one crossing of the corridor study area, near the Town of Greenbush.



Floodplains

River crossings along WIS 23 with designated 100-year floodplains that provide several ecosystem functions include the Sheboygan and Mullet Rivers.

Groundwater and Water Supply

Ground water comes from natural underground reservoirs, or aquifers. There are three main aquifer types: sand and gravel glacial drift aquifer (shallow system), the dolomite aquifer (shallow system), and the sandstone aquifer (deep artesian system). The depths of the aquifers vary throughout the study area. Groundwater used domestically within the project corridor is supplied from the sand and gravel aquifer consisting of permeable sediments of unconsolidated glacial deposits. Depth to groundwater varies with land surface characteristics. Drinking water in the study area is supplied by private wells.

Wetlands

High quality wetlands Sheboygan County are concentrated south of WIS 23 in the vicinity of the Kettle Moraine State Forest, Old Wade House Historic Site and along the Mullet River. A wetland compensation site was created, as a part of the State Historical Society dam reconstruction project at the Old Wade House property, immediately south of WIS 23. Any modifications to the Old Wade House wetland compensation site must be coordinated with the Army Corps of Engineers.

Similarly in Fond du Lac County, high quality wetlands occur in the following areas:

- | | |
|--|---|
| North of WIS 23 between Pit Road and Triple T Road | – Mixed hardwood and cedar swamp |
| At the Sheboygan River area crossing WIS 23 | – Riparian emergent wet meadow |
| South of WIS 23 near Division Road | – Shrub swamp |
| South of WIS 23 adjacent to Hillview Road | – Mullet Creek Wildlife Area, mixed hardwoods and emergent wet meadow |

Uplands

Upland areas in the corridor are predominantly found in the Kettle Moraine region in Sheboygan County and the Niagara Escarpment in Fond du Lac County. Between these two features is an undulating region made up of outwash plains, moraines, and drumlins. A large ridge rises up in the central area of the project corridor that provides a good habitat for a variety of plants and wildlife. The vegetated uplands along the corridor include the dominant tree species of sugar maple, basswood elm, red oak, white oak and black oak. Common ground plants are sweet cicely, mayapple, wild leek, wild geranium, and false Solomon's seal. Other less common plants found are black spruce, tamarack white cedar and hemlock. Native vegetation of these areas supports a variety of deciduous forest, forest-edge, and riparian species.

Wildlife

The mix of wetlands, upland woods, and non-tilled farmland, provides habitat for a variety of wildlife species. White-tailed deer, raccoon, striped skunk, turkey, squirrel, and grouse would be common in forest and forest-edge habitats. Open areas would support populations of rabbit, coyote, and a variety of small rodents, as well as songbirds and raptors. Aquatic mammals, turtles, freshwater mussels, migratory waterfowl, and a variety of fish would be present in the river and wetland settings in the region.

Endangered or Threatened Species

Based a search of the Natural Heritage database by WDNR (see Appendix D, Comments and Coordination) and on previous surveys at Old Wade House, and additional surveys conducted on August 27, 2002, two State Threatened mussel species occur in the Sheboygan and Mullet Rivers and their tributaries: Slippershell Mussel, *Alasmidonta viridis*; *Ellipse*, *Venustaconcha ellipsiformis*.

The State Threatened Butler's gartersnake, *Thamnophis butlerii*, has been recorded just south of the project area. The species favors open meadow and partial shrub wetlands with adjacent undeveloped lands. Since no surveys have been conducted north of the recorded sites, and the project area has suitable habitat for this species, Butler's garter snake may occur in the project area as well.

Air Quality

Air pollution is the contamination of the atmosphere with gases or particulate matter that are harmful to the human environment. The United States Environmental Protection Agency (USEPA), through the 1970 Clean Air Act, has established National Ambient Air Quality Standards (NAAQS) for seven Criteria Air Pollutants. These Criteria Air Pollutants are regulated by USEPA on the basis of information on health and environmental effects. The seven pollutants are: ozone (O₂), nitrogen dioxide (NO₂) carbon monoxide (CO), sulfur dioxide (SO₂), uninhalable particulate matter (PM₁₀), hydrocarbons (HC) and airborne lead (Pb). The 1977 and 1990 Clean Air Act Amendments reinforced attainment and maintenance of these standards.

These standards have been adopted by the State of Wisconsin through Wisconsin Administrative Code - Chapter NR 404. Air quality standards are definitions of the characteristics of ambient air quality that in terms of present day knowledge, need to be maintained in order to protect the public health and welfare and our environment from adverse effects of air pollution. The goal of the air quality regulations is to ensure that various levels of pollutants do not exceed set standards and, where pollution levels are presently less than standards, to prevent the significant deterioration of the ambient air quality.

The proposed WIS 23 project is located in the Lake Michigan Intrastate Air Quality Control Region. Fond du Lac County is presently in attainment of all NAAQS for all pollutants of concern. Sheboygan County is a non-attainment area for ozone standards. As of April 2004, Sheboygan County is designated a maintenance area for the 1-hour ozone standard and a nonattainment for the 8-hour standard by the USEPA.

Noise

Sound levels are measured in units called decibels. Since the human ear does not respond equally to all frequencies (or pitches), measured sound levels are often adjusted or weighted to correspond to the frequency response of human hearing and the human perception of loudness. The weighted sound level is expressed in units called A-weighted decibels (dBA) and is measured with a calibrated sound level meter. Table III-9 provides an illustration of typical sound levels in dBA. Sound levels, which correlate with the human perception, are also expressed with the descriptor Leq. The term Leq is defined as the equivalent steady-state sound level, which, in a stated period of time, contains the same acoustical energy as the time-varying sound level during the same period.

Table III-9

Activity Category	Leq	Description of Activity Category
A	57 dBA (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 dBA (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 dBA (Exterior)	Developed lands, properties, or activities not included in categories A or B above.
D	-----	Undeveloped lands.
E	52 dBA (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Noise is defined as unwanted sound. The sounds generated by vehicular traffic and residential and commercial development in the study area constitutes noise to people and can interrupt normal activities when they reach certain levels. Areas that would likely be sensitive to noise include residential developments, recreational areas, schools, churches and cemeteries. Commercial and industrial land uses would generally be less sensitive to noise.

Noise sensitive sites along WIS 23 have been identified and readings have been taken at representative locations using a Larsen Davis 312 Noise Meter to determine existing noise levels. See Section IV, Factor Sheets N-3 to N-7 for sound level reading locations. A more detailed discussion of the existing and future sound levels, possible noise impacts and possible mitigation measures can be found in Section IV, Environmental Consequences. A discussion of construction related noise impacts and possible mitigation measures may also be found in Section IV – Factor Sheet N, Environmental Consequences.

Contaminated Materials

A Phase I hazardous material screening inventory was done within the corridor study area along WIS 23. The review identified apparent sources of hazardous materials, and assesses the potential for affecting sites that may contain environmental contaminants. The results are discussed in Section IV - Factor Sheet R.

Soils and Mineral Resources

Glacial landforms dominate the WIS 23 corridor and most soils were derived from till and outwash deposits. Bedrock along WIS 23 consists of dolomite limestone with varying thickness of up to 200 feet thick. Marsh deposits of varying depth can be found near any of the four watershed areas along the project (Sheboygan, Mullet, and Onion Rivers, and Eastern Lake Winnebago Watersheds).

Moderate to rapid permeability soils dominate the project area. Soils along WIS 23 in Fond du Lac

County can be identified within four soil classification groups:

- Theresa-Pella-Lamartine association: Well-drained to poorly drained, silty, moderately permeable soils underlain by calcareous loam and sandy loam till.
- Kewaunee-Manawa-Polgan association: Well-drained to poorly drained, silty and clayey, moderately slowly to slowly permeable soils underlain by calcareous till or lacustrine sediments.
- Fox-Casco association: Well-drained loamy, moderately permeable soils underlain by calcareous sand and gravel.
- Houghton-Palms association: Organic soils over calcareous outwash, till, or lacustrine deposits.

Soils along WIS 23 in Sheboygan County can be identified within two soil classification groups:

- Hochheim-Theresa association: Well drained soils that have a subsoil of mainly clay loam or silty clay loam and are underlain by gravelly sandy loam glacial till.
- Casco-Fox-Rodman association: Well drained to excessively drained soils that have a subsoil of mainly silty clay lam to sandy clay loam or gravelly sandy loam and are underlain by stratified gravel and sand outwash.

There are active sand/gravel pits within the projects study area. Under WisDOT contracts, the contractor may select his own source of materials as long as they meet contract specifications.

Aesthetics

The visual character and aesthetic quality of an area is created by its composition of landscape features including landforms, streams and other water bodies, wetlands, woodlands, open space such as cropland, historic structures, commercial and residential development, parkland and other recreational facilities.

The natural scenery along this section of WIS 23 runs through rolling glacial moraines and drumlins and crosses two unique glacial features. The Niagara Escarpment on the far west section of WIS 23, rising 300 feet above Lake Winnebago and the Kettle Moraine State Forest near the Town of Greenbush, forested glacial moraine, provide exceptional and unique views to this area of Wisconsin. The Sheboygan River crossing is visible wetland basin adjacent to WIS 23. Between these major features are several drumlins, hills, and outwash plains that consist of several wetlands and woodlands.

This region has been settled mostly as a farming area, thus providing a scenic rural setting and scenic panoramas of the countryside on these hills. Visible landscape features include pasturelands, farmsteads, and residential homesteads. The existing highway consists of concrete and bituminous pavements with gravel shoulders. The existing roadway is exhibiting some signs of distress (cracks and ruts). A bridge spans the Sheboygan River. Aesthetic quality of the majority of this corridor is considered moderate to high.

CULTURAL RESOURCES

Archaeological/Historical Resources

This region has been the scene of human occupation for at least 10,000 years, spanning the Paaleoindian Period to modern times. The Lake Winnebago and Fox River drainage has been the primary focus of historical and archaeological study since the late 1800's.

An archaeological literature and records search was undertaken to identify previously reported resources and burial sites near the corridor study area including a Phase I Survey. Archaeological and burial sites have been reported within one mile of the study area. Native American components have been identified at several of these previously recorded sites.

An identification survey was conducted, including a windshield survey of historic properties located within an approximately 19 mile long corridor that stretches 1 mile on either side of WIS 23 from County K to County P. Background research identified properties within the corridor that are listed on the National Register of Historic Places (NHRP) or included in the WI Architecture and History Inventory. The Old Wade House State Park is already on the NHRP. The Wisconsin Historical Society has completed a Determination of Eligibility on the NHRP for the St. Mary's Springs Academy. No other properties in or adjacent to the project area have been determined to be eligible on the NHRP. Three other properties have been identified on Hickory, Tower, and Spruce Roads that may be eligible but are not found within the alternative corridors and therefore will not be affected.

ENVIRONMENTAL JUSTICE

Executive Order on Environmental Justice 12898 requires all federal agencies to address the impact of their programs with respect to environmental justice. The Executive Order states that, to the extent practicable and permitted by law, neither minority nor low-income populations may receive disproportionately high or adverse impacts as a result of a proposed project. It also requires that representatives of any low-income or minority populations that could be affected by the project in the community be given the opportunity to be included in the impact assessment and public involvement process. Consistent with Title VI of the 1964 Civil Rights Act and Executive Order 12898 on Environmental Justice, the project should benefit all segments of society, including those that have been underserved and underrepresented. The project should improve accessibility for all persons, including minorities and the economically disadvantaged in both urban and rural areas.